REMARKS

This Amendment is filed in response to the Office Action dated April 4, 2005. For the following reasons this application should be allowed and the case passed to issue. No new matter is introduced by this amendment. Claims 1, 5, 9, and 17, and the specification have been amended in accordance with the Examiner's recommendations to correct informalities. In addition, claim 1 has been amended to incorporate limitations from claims 4 and 7, and claim 17 has been amended to incorporate limitations from claim 26. Claims 4 and 8 have been amended to correct informalities and make them consistent with claim 1. The amendment to claim 6 is supported by claim 1 as previously presented. The amendment to claim 23 is supported by claim 24. The amendment to claim 25 is supported by claim 17 as previously presented. New claim 27 is supported by claim 25. Support for new claim 28 is found in claim 17 as previously presented. New claim 29 is supported by claim 6 as previously presented. Support for new claim 30 is found in claim 1 as previously presented. New claims 31 and 32 are supported by claims 1 and 6 as previously presented.

Claims 1-6, 8-18, 20, 21, 23, 25, and 27-32 are pending in this application. Claims 10-16, 18, 20, and 21 have been withdrawn pursuant to a restriction requirement. Claims 1-9, 17, 19, and 23-26 have been rejected. Claims 4, 7, 9, and 26 have been objected to. Claims 1, 4-6, 8, 9, 17, 23, and 25 have been amended in this response. Claims 7, 19, 22, 24, and 26 have been canceled. New claims 27-32 have been added.

Allowable Subject Matter

Claims 7 and 26 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form. The Examiner indicated that the prior art does not teach a non-magnetic interlayer comprising the claimed first and second Ru layers.

Applicants gratefully acknowledge the indication of allowable subject matter. In accordance with the Examiner's recommendation, independent claims 1 and 17 have been amended to include the limitations of claims 7 and 26, respectively.

Claim Objections

Claims 4[1] and 9 were objected to because Ru is listed twice. This objection is traversed, and reconsideration and withdrawal thereof respectfully requested. Claims 5 and 9 have been amended to delete the recitations of Ru.

Claim Rejections Under 35 U.S.C. § 112

Claims 1-9, 17, 19, and 23-26 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The Examiner asserted that the limitation "as low as about 95 °C" had at least 2 interpretations. This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested.

In accordance with the Examiner's recommendation, "as low as about 95 °C" has been changed to --greater than about 95 °C--.

Claim Rejections Under 35 U. S. C. § 103

Claims 1-5, 17, 19, and 23 were rejected under 35 U. S. C. § 103(a) as being unpatentable over Watanabe et al. (U.S. Pub. App. No. 2004/0000374) in view of Oyanagi et al. (U.S. Patent No. 6,066,380), Kubota et al. (U.S. Pub. App. No. 2002/0058159) and Applicants' admissions. This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested. The following is a comparison between the instant invention as claimed and the cited prior art.

An aspect of the invention, per claim 1, is a perpendicular magnetic recording medium, comprising a substrate of an amorphous thermoplastic polymer material having softening and glass transition temperatures greater than about 95 °C. At least one stack of thin film layers is formed on at least one surface of the substrate. The at least one layer stack includes at least one granular magnetic recording layer of perpendicular type, at least one soft magnetic layer, and at least one non-magnetic interlayer. The at least one non-magnetic interlayer comprises first and second Ru layers. The first Ru layer is adjacent the soft magnetic underlayer and is sputter-deposited to a lesser thickness than the second Ru layer and in a lower inert gas pressure atmosphere than that utilized for sputter-depositing the second Ru layer.

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[1] Apparently the Examiner intended to object to claim 5, as claim 5 previously recited Ru twice.

Another aspect of the invention, per claim 17, is a perpendicular magnetic recording medium manufactured by a method comprising steps of providing a substrate of an amorphous thermoplastic polymer material having softening and glass transition temperatures greater than about 95 °C. At least one stack of thin film layers is formed atop at least one surface of the substrate. The at least one layer stack includes at least one granular perpendicular magnetic recording layer. Each of the thin film layers is formed by depositing at a substrate temperature not greater than about 70 °C. The step of forming the at least one layer stack includes forming at least one soft magnetic underlayer and at least one non-magnetic interlayer. The at least one non-magnetic interlayer comprises first and second Ru layers. The first Ru layer is adjacent the soft magnetic underlayer and is sputter-deposited to a lesser thickness than the second Ru layer and in a lower inert gas pressure atmosphere than that utilized for sputter-depositing the second Ru layer.

The Examiner averred that Watanabe et al. disclose a perpendicular magnetic recording medium comprising a thermoplastic polymer substrate, at least one stack of thin film layers comprising at least one granular magnetic layer and at least one soft magnetic layer. The Examiner acknowledged that Watanabe et al. do not explicitly disclose using a substrate of an amorphous thermoplastic polymer having a softening and glass transition temperature as low as about 95 °C and the use FeCoB in a soft magnetic underlayer. The Examiner relied on the teaching of Oyanagi et al. and Applicants' alleged admissions to conclude that it would have been obvious to use a substrate meeting Applicants' claimed material limitations because such a substrate allows for excellent heat resistance, precision moldability, low moisture absorption and are readily available and economically affordable. In addition, the Examiner relied on the Kubota et al. teaching of FeCoB soft magnetic layers to conclude that it would have been obvious to include soft magnetic FeCoB layers in the recording medium of Watanabe et al. because they can provide extremely smooth surfaces and radial orientation while possessing high saturation magnetization.

The Examiner's use of Applicants' alleged admissions in rejections of the instant claims is traversed. The Examiner has improperly used the instant specification as prior art. Applicants' disclosure is not prior art and cannot be used as such. Applicants have not made any admission that the use of the claimed materials as a substrate in the claimed perpendicular magnetic recording medium is prior art.

Further, Watanabe et al., Oyanagi et al., and Kubota et al., whether taken alone, or in combination, do not suggest the claimed perpendicular recording medium because they do not suggest the at least one non-magnetic interlayer comprising first and second Ru layers, wherein the first Ru layer is adjacent the soft magnetic underlayer and is sputter-deposited to a lesser thickness than the second Ru layer and in a lower inert gas pressure atmosphere than that utilized for sputter-depositing the second Ru layer, as required by claims 1 and 17. The Examiner acknowledged that the cited references do not suggest this feature, as the Examiner only objected to claims 7 and 26.

Claim 6 is rejected under 35 U. S. C. § 103(a) as being unpatentable over Watanabe et al. in view of Oyanagi et al., Kubota et al., and Applicants' admissions, and further in view of Sugita et al. (U.S. Pat. No. 4,687,712), Fujimura et al. (U.S. Pat. No. 5,466,308), Platt et al. (IEEE Trans. Mag., 37(4), 2002, 2302-2304), and Kraus et al. (IEEE Trans. Mag., 30(2), 1994, 530-532). This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested.

The Examiner acknowledged that Watanabe et al., Oyanagi et al., Kubota et al., do not disclose that the at least one soft magnetic underlayer comprising FeCoB comprises $FeCo_{30.6}B_{12.5}$. The Examiner asserted that Fujimura et al., Kraus et al., and Platt et al. teach the amount of Fe, Co, and B can be varied to effect the soft magnetic properties in the alloy, and that an alloy having ~ 12% B exhibits an excellent combination of low coercivity and high magnetization. The Examiner deemed the $FeCo_{30.6}B_{12.5}$ an obvious composition obtained by optimizing the results effective variable through routine experimentation. In addition, the Examiner deemed the amount of Pt in CoPt taught by Watanabe et al. to be a results effective variable and therefore the claimed $CoPt_{18}$ was obvious because Watanabe et al. disclose a compound comprising Co and 17% Pt.

Initially, it is noted that amended claim 6, no longer requires $FeCo_{30.6}B_{12.5}$, however, claims 23, 25, 29, and 31 require $FeCo_{30.6}B_{12.5}$. Contrary to the Examiner's assertions, the use of $FeCo_{30.6}B_{12.5}$ in the soft magnetic layers of Watanabe et al., in view of Oyanagi et al., and Kubota et al. would not have been obvious. It would not have been obvious to combine Fujimura et al. with Watanabe et al., in view of Oyanagi et al., and Kubota et al. to achieve the claimed magnetic recording medium. The FeCoB compounds of Fujimura et al. are permanent magnetic materials (hard magnetic material), not soft magnetic material, as required by the instant claims.

Neither Kraus et al. nor Platt et al. suggest the specific FeCoB material, $FeCo_{30.6}B_{12.5}$, as required by claims 23, 25, 29, and 31. Kraus et al. teach adding B to $Fe_{65}Co_{35}$, not $FeCo_{30.66}B_{12.5}$, as required by claims 23, 25, 29, and 31. Platt et al. disclose $(FeCo)_{85}B_{15}$, not $FeCo_{30.6}B_{12.5}$, as required by claims 23, 25, 29, and 31.

Furthermore, there is no motivation to combine the FeCoB compounds of Fujimura et al., Kraus et al., and Platt et al. in the soft magnetic recording layer of Watanabe et al. in view of Oyanagi et al., and Kubota et al. to provide the claimed magnetic recording medium.

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge readily available to one of ordinary skill in the art. *In re Kotzab*, 217 F.3d 1365, 1370 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). There is no suggestion in Fujimura et al., Kraus et al., and Platt et al. to substitute the specific FeCoB compound, $FeCo_{30.6}B_{12.5}$, into the soft magnetic layer of Watanabe et al. in view of Oyanagi et al. and Kubota et al. to provide the magnetic recording medium required by claims 23, 25, 29, and 31.

The mere fact that references can be modified does not render the resulting combination obvious unless the prior art also suggests the desirability of the modification. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Fujimura et al., Kraus et al., and Platt et al. do not suggest the desirability of substituting the specific FeCoB compound, $FeCo_{30.6}B_{12.5}$, into the soft magnetic layer of Watanabe et al. in view of Oyanagi et al. and Kubota et al. to provide the magnetic recording medium required by claims 23, 25, 29, and 31.

The requisite motivation to support the ultimate legal conclusion of obviousness under 35 U.S.C. § 103 is not an abstract concept, but must stem from the applied prior art as a whole and realistically impel one having ordinary skill in the art to modify a specific reference in a specific manner to arrive at a specifically claimed invention. *In re Deuel*, 51 F.3d 1552, 34 USPQ2d 1210 (Fed. Cir. 1995); *In re Newell*, 891 F.2d 899, 13 USPQ2d 1248 (Fed. Cir. 1989). Accordingly, the Examiner is charged with the initial burden of identifying a source in the applied prior art for the requisite realistic motivation. *Smiths Industries Medical System v. Vital Signs, Inc.*, 183 F.3d 1347, 51 USPQ2d 1415 (Fed. Cir. 1999); *In re Mayne*, 104 F.3d 1339, 41 USPQ2d 1449 (Fed. Cir. 1997). The Examiner has not identified any motivation in Fujimura et al., Kraus et al., and Platt et al. to substitute the specific FeCoB compound, $FeCo_{30.6}B_{12.5}$, into the soft magnetic layer of Watanabe et al. in view of Oyanagi et al. and Kubota et al. to provide the magnetic recording medium required by claims 23, 25, 29, and 31.

The only teaching of the claimed perpendicular magnetic recording medium is found in Applicants' disclosure. However, the teaching or suggestion to make a claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

As regards the Examiner's assertion that the claimed $CoPt_{18}$ compound required by claim 6 would have been obvious, Applicants note that Watanabe et al. disclose a $CoCrPt\text{-}SiO_2$ layer deposited using a target of $(Co\text{-}10Cr17Pt)\text{-}9SiO_2$. Though, 17% Pt may be close to 18% Pt, the claimed magnetic recording layer $CoPt_{18}$ is very different and unobvious in view of the Watanabe et al. teaching of a $CoCrPt\text{-}SiO_2$ magnetic recording layer, not a $CoPt_{17}$ layer as implied by the Examiner. Because the cited prior art does not suggest the claimed perpendicular magnetic recording medium comprising at least one granular perpendicular hard magnetic recording layer comprising $CoPt_{18}$, Applicants submit that new claim 32 is unobvious, and hence, allowable.

Claims 8 and 9 are rejected under 35 U. S. C. § 103(a) as being unpatentable over Watanabe et al. in view of Oyanagi et al., Kubota et al., and Applicants' admissions, and further in view of Sugita et al. This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested.

Dependent claims 8 and 9 are allowable for at least the same reasons as independent claim 1 and further distinguish the claimed invention. Sugita et al. do not cure the deficiencies of Watanabe et al., Oyanagi et al., and Kubota et al. because Sugita et al. do not suggest the claimed perpendicular recording medium because Sugita et al. do not suggest the at least one non-magnetic interlayer comprising first and second Ru layers, wherein the first Ru layer is adjacent the soft magnetic underlayer and is sputter-deposited to a lesser thickness than the second Ru layer and in a lower inert gas pressure atmosphere than that utilized for sputter-depositing the second Ru layer.

Claims 24 and 25 are rejected under 35 U. S. C. § 103(a) as being unpatentable over Watanabe et al. in view of Oyanagi et al., Kubota et al., and Applicants' admissions, and further in view of Fujimura et al., Platt et al., and Kraus et al. This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested.

Claim 24 has been canceled. Claim 25 is allowable for at least the same reasons as independent claim 17 and further distinguishes the claimed invention.

Applicants submit that the dependent claims are allowable for at least the same reasons as the independent claims and further distinguish the claimed invention. In addition, Applicants submit that new claims 27-32 are allowable for at least the reasons discussed above.

In view of the above amendments and remarks, Applicants submit that this application should be allowed and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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